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Multiple jet to generate radial displacement flow.

The invention refers to a device for air intake at a limited clean-room work area. In industrial manufacturing processes and especially in aseptic operations, dust-free or germ-free work conditions in the work zone or the operation zone are generated by means of clean air displacement flows.

In order to meet these requirements, it is known that workrooms or operation theatres have to be ventilated in such a way that turbulence-free displacement flows, coming from one side of the room, either horizontal or vertical or even diagonal, are generated, which flow through the entire room cross-section and deviate floating particles from the clean-room, and shall also conduct the particles, spread by work processes and human beings, towards the exhaust air outlet opposite the supply air inlet. Moreover, another arrangement is known, where a clean air flow is conducted towards an operating area through an axial and turbulent, diagonally directed jet.

In order to work well, these known systems require a very disciplined behaviour of the employees in the clean-room. Contaminated air often reaches the clean area through disturbing bodies like lamps, technical devices, human beings and thermal buoyancy. The energy expenditure corresponds to the big flow cross-sections.

The invention is intended to eliminate the incalculable influence of the disturbance sources and to reduce the energy and investment expenditure.

This task is resolved, according to the invention, by the fact that the clean air intake is placed between the clean-room and the disturbance source and that the clean air is conducted radially against the disturbance sources.

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Garbsen, March 23, 2008

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A dome-shaped multiple jet conducts radially directed clean air over the clean zone. By means of a retaining layer placed in front of the honeycombed jet casing and the numerous radially arranged expanding jets, below an angle which is smaller than 15° , a basically induction-free and conical expansion of the supply air and a reduction of the exit velocity according to the relationship $v_1 = w_1 \cdot r_1^2 / r_2^2$ is achieved. This flow behaviour, otherwise only observed at exhaust outlets, results in the absence of draught, even in a short distance.

The advantage achieved by this invention consists especially in the fact that restrictions, imposed on the staff with known systems, become unnecessary, impairments of the operational reliability are eliminated and the investment and energy expenditure is reduced.

An arrangement above the operating tables is of special advantage, where the described multiple jet is integrated into the support of an operating lamp and where the support is dimensioned in such a way that the bearing flanged pipe serves as a clean air lead-in towards the multiple jet arranged at the lower, frontal end of the support, since the swivel range of the lamp is not impaired in this way and flow disturbances through luminous bodies are avoided.

The drawing shows design examples of the invention.

Fig. 1 shows a sectional detail view through a multiple jet.

- 1 supply air nozzles
- 2 layer of retaining tissue
- 3 honeycombed jet casing
- 4 protection layer made of wire mesh

Fig. 2 illustrates in a cross-section through a room to be ventilated the arrangement of the air intake device at the supporting tube of an operating lamp as well as the radially directed displacement flow.

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